# Naive Bayes

Nipun Batra

IIT Gandhinagar

July 29, 2025

What happens when a feature value appears in test data but not in training data?

What happens when a feature value appears in test data but not in training data?

What happens when a feature value appears in test data but not in training data?

Compare Naive Bayes with logistic regression - when would you choose each?

► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence

► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► **Efficient Training**: Simple parameter estimation from training data

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► **Efficient Training**: Simple parameter estimation from training data

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► Efficient Training: Simple parameter estimation from training data
- ► Handles Multiple Classes: Naturally extends to multi-class problems

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► Efficient Training: Simple parameter estimation from training data
- ► Handles Multiple Classes: Naturally extends to multi-class problems

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► Efficient Training: Simple parameter estimation from training data
- ► Handles Multiple Classes: Naturally extends to multi-class problems
- ► Good with Small Data: Works well with limited training examples

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► Efficient Training: Simple parameter estimation from training data
- ► Handles Multiple Classes: Naturally extends to multi-class problems
- ► Good with Small Data: Works well with limited training examples

- ► **Probabilistic Foundation**: Based on Bayes' theorem and conditional independence
- ► Naive Assumption: Features are conditionally independent given the class
- ► Efficient Training: Simple parameter estimation from training data
- ► Handles Multiple Classes: Naturally extends to multi-class problems
- ► Good with Small Data: Works well with limited training examples
- ▶ Interpretable: Probabilistic outputs provide confidence measures